

REMARKS

Claims 1-6 are pending for further examination. Claims 1, 5 and 6 are currently amended.

Claim Rejections

Claims 1-6 were rejected under 35 U.S.C. § 103(a) as unpatentable over the Maruyama et al. reference (U.S. Patent App. No. 2004/0208211) in view of the Uchida reference (U.S. Patent App. No. 2002/0109074).

In view of the foregoing amendment and the following remarks, Applicant respectfully requests reconsideration and withdrawal of the claim rejections.

Claim 1 is currently amended to recite that a communication module includes a flexible printed circuit board and a stem through which the board is inserted and to which the board is fixed. The board includes a “polyimide resin” and is fixed to the stem with a fixing material having a melting point “in a range of 300 to 350 °C.”

An example of those features is disclosed in paragraphs [0017] and [0019] of the present application. In that example, a flexible printed circuit board has a structure in which one or more layers of wiring patterns are formed within an insulative basic material made of polyimide resin. An insulative cover made of polyimide resin is formed over the surfaces of that basic material. When the flexible printed circuit board is fixed to a stem, a fixing material, such as solder or a glass of a low melting point, may be used (*see* FIG. 1). The fixing material can have a melting point on the order of “300 to 350 degrees centigrade.” Accordingly, the melting point of the fixing material is not high enough to damage the polyimide flexible printed circuit board when fixing the board to the stem. On the other hand, the melting point is high enough that subsequent heating of the communication module does not soften the fixing material during mounting of semiconductor components. As a result, the flexible printed circuit board will not slip out of position in the stem.

In contrast, neither the Maruyama et al. reference nor the Uchida reference discloses or renders obvious, alone or in combination, the subject matter of pending claim 1.

As shown in FIG. 1, the Maruyama et al. reference discloses an optical communication module that includes a driver LSI 7, a ceramic substrate 3 provided with wiring 13, and a disc-type can stem 1 through which the ceramic substrate 3 is fixed (*see* para. [0055]). The Maruyama et al. reference fails to disclose that the substrate 3 is “flexible.” The Office action relies on the Uchida reference for this feature.

The Uchida reference discloses an optoelectronic board on which a photonic IC can be mounted. The optoelectronic board consists of a pair of optical wiring layers 4108 and one multi-layer wiring layer 4107. Both the multi-layer wiring layer and the optical wiring layer can be formed of flexible materials, allowing the substrate to be bent at 90 degrees (*see* [0336]-[0338]).

The Office action alleges that it would have been obvious to use the optoelectronic board of the Uchida reference in the electronic device of the Maruyama et al. reference for “easier mounting.” Applicant respectfully disagrees and submits that it would not have been obvious to one of ordinary skill in the art to incorporate the optoelectronic board of the Uchida et al. reference as a flexible printed circuit board in the device of the Maruyama et al. reference for easier mounting.

First, there is no disclosure in either the Maruyama et al. reference or the Uchida et al. reference that the use of a flexible board makes mounting any easier. Although the Uchida et al. reference discloses that the flexible substrate can be bent at 90 degrees, such bending is clearly not required to mount the substrate 3 of the Maruyama et al. reference to the can-stem 1. Moreover, the Office action has not provided any explanation as to how mounting the substrate 3 of the Maruyama et al. reference can be made easier if replaced with the flexible optoelectronic board of the Uchida et al. reference. Indeed, Applicant fails to see how the use of a flexible substrate in place of the ceramic substrate 3 of the Maruyama et al. reference would improve the ease of mounting. Accordingly, Applicant submits that it would not have been obvious to one of

ordinary skill in the art to use the flexible substrate of the Uchida reference in place of the ceramic substrate 3 of the Maruyama et al. reference.

Even if the ceramic substrate 3 of the Maruyama et al. reference were replaced by the optoelectronic board of the Uchida et al. reference, the resulting combination would neither anticipate the claimed subject matter nor operate as intended.

The Maruyama et al. reference discloses that a silver alloy brazing process is used to fix the ceramic substrate 3 to the stem 4 (*see* para. [0057]). It is well known by those of ordinary skill in the art that, during the brazing process, the silver alloy is heated to melting temperatures of about 650 °C. In contrast, pending claim 1 recites that the board is fixed to the stem with a fixing material having a melting temperature in the range of “300 to 350 °C.”

In addition, even if the optoelectronic board of the Uchida reference included the claimed “polyimide resin,” (which the Applicant does not concede), the resulting combination would fail to operate as intended. In particular, the high melting temperature of the silver alloy brazing process would damage the polyimide resin such that the communication module would not function properly. Accordingly, it would not have made sense for one of ordinary skill in the art to replace the ceramic substrate 3 of the Maruyama et al. reference with the optoelectronic board of the Uchida reference.

At least for the foregoing reasons, claim 1 should be allowed.

Claims 2-6 depend from claim 1 and should be allowed for at least the same reasons as claim 1.

It is believed that all of the pending claims have been addressed. However, the absence of a reply to a specific rejection, issue or comment does not signify agreement with or concession of that rejection, issue or comment. In addition, because the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this paper should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this paper.

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Serial No. : 10/562,630
Filed : December 23, 2005
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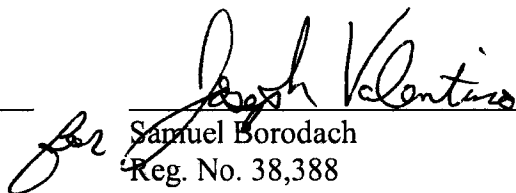
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No fee is believed due. However, please apply any charges or credits to deposit account
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Respectfully submitted,

Date: _____

6/19/08

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